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A.D. 1860, 26th DECEMBER. N° 3164.

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S P E C I F I C A T I O N

OF

JOHN HENRY JOHNSON.

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INSTRUMENTS FOR ASSISTING THE SENSE  
OF HEARING.

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L O N D O N :

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A.D. 1860, 26th *DECEMBER*. N° 3164.

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**Instruments for Assisting the Sense of Hearing.**

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**LETTERS PATENT** to John Henry Johnson, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of 166, Buchanan Street, in the City of Glasgow, North Britain, Gentleman, for the Invention of "**IMPROVEMENTS IN INSTRUMENTS FOR ASSISTING THE SENSE OF HEARING.**"—A communication from abroad by Charles Grafton Page, of Washington, in the District of Columbia, in the United States of America.

Sealed the 22nd March 1861, and dated the 26th December 1860.

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**PROVISIONAL SPECIFICATION** left by the said John Henry Johnson at the Office of the Commissioners of Patents, with his Petition, on the 26th December 1860.

I, JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of 166, Buchanan Street, in the City of Glasgow, North Britain, Gentleman, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN INSTRUMENTS FOR ASSISTING THE SENSE OF HEARING,**" a communication from abroad by Charles Grafton Page, of Washington, in the District of Columbia, in the United States of America, to be as follows:—

10 This Invention relates to a peculiar construction and arrangement of appa-



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ratus for assisting the sense of hearing, and consists in the employment of simple deflectors of sound, in the form of open-mouthed chambers, by preference of a curved and conic section, applied in any convenient manner to the exterior of the ears, so as to deflect the sound into the ear passage. By this apparatus the "roar" or continued murmuring sound attendant upon the use of the 5 ordinary ear tube or trumpet, having one end inserted into the ear is prevented. These deflectors may be fitted to a spring bow placed over the top of the head, or they may be made to form part of a hat, bonnet, or other head dress.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed 10 by the said John Henry Johnson in the Great Seal Patent Office on the 26th June 1861.

**TO ALL TO WHOM THESE PRESENTS SHALL COME**, I, JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of 166, Buchanan Street, in the City of Glasgow, North Britain, 15 Gentleman, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-sixth day of December, in the year of our Lord One thousand eight hundred and sixty, in the twenty-fourth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the 20 said John Henry Johnson, Her special license that I, the said John Henry Johnson, my executors, administrators, and assigns, or such others as I, the the said John Henry Johnson, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might 25 make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN INSTRUMENTS FOR ASSISTING THE SENSE OF HEARING**," a communication from abroad by Charles Grafton Page, of Washington, in the District of Columbia, in the United States of America, upon the condition 30 (amongst others) that I, the said John Henry Johnson my executors or administrators, by an instrument in writing under my hand and seal, or under the hand and seal of one of them, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was



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to be performed and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said John Henry Johnson, do hereby  
5 declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings and to the letters and figures marked thereon, that is to say :—

The said Invention relates to a peculiar construction and arrangement of  
10 apparatus for assisting the sense of hearing, and consists in the employment of simple deflectors of sound, in the form of open-mouthed chambers, by preference of a curved and conic section, applied in any convenient manner to the exterior of the ears, so as to deflect the sound into the ear passage. By this apparatus the “roar” or continued murmuring sound attendant upon the use of the  
15 ordinary ear tube or trumpet, having one end inserted into the ear is prevented. These deflectors may be fitted to a spring bow placed over the top of the head, or they may be made to form part of a hat, bonnet, or other head dress.

And in order that the said Invention may be fully understood, I shall now  
20 proceed more particularly to describe the same, and for that purpose I shall refer to the several Figures on the Sheet of Drawings hereunto annexed, the same letters of reference indicating corresponding parts throughout all the Figures.

Figure 1 represents a perspective view of the improved apparatus or instru-  
25 ment; Figure 2 is a longitudinal section of the same; Figure 3 is a front elevation of the instrument; Figure 4 is a back elevation of the same attached to a spring bow for holding it in its place; and Figure 5 represents the mode of applying or wearing the instrument.

A, B, and E, Figures 1, 2, and 3, indicate the general contour of the  
30 instrument, which is represented full size as used. The deflector A should be constructed on the principle of a conic section, and such as to prevent as much as possible repeated reflections in the instrument itself, or between it and the head and parts of the ear, as the “roar” so objectionable in other devices is due to repeated reflections or reverberation.

35 A variety of forms will suffice to deflect vibrations in such a manner as to augment sound, but there are certain characteristics essential to the best effects to obviate the “roar,” so as to enable the ear to discriminate sounds, and one which may be best understood by common phrase is the “open flare,”



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which obviates double reflection or reverberation. It is also of importance that the deflecting surface terminate in conformity with the line of the cartilaginous ridge, which circumscribes the central opening of the ear, so as to prevent the passage or escape of aerial vibrations beyond that line, for that in fact is the natural limit of the sound-gathering function of the external ear. 5 It is also important that all aerial vibrations from behind should be intercepted, and that the instrument should be so constructed as to close well upon the ear behind, so as to intercept interfering sounds, and insure the reflection of vibrations from before, and deflect them to the external meatus. The main portion A of the deflector is represented by a conic section, but for the purpose 10 of complete reflection to the external meatus the deflector takes a curvilinear form at or about the part E (Figures 1 and 2). A plain surface in lieu of the curved surface would have a good effect, but not so good as that of the curved surface at this point. The chamber B is of the general outline form of the ear, and is designed to enclose or surround it completely when the instru- 15 ment is in use, it being also adapted on the edge at *n* to the form of the head at that part. The chamber B may be dispensed with, and the deflector fitted to cover the ear from behind, thus simplifying the construction, but at some little sacrifice of the efficiency of the instrument. The deflector may (especially under the latter form), be worn in almost any position with its open or flaring 20 portion in front, up, down, or directly backwards, which latter position gives a good effect. The deflectors are held in their places on the head by the spring bow F (Figure 4), and this bow may be adjusted so as to fit different heads and also to adapt the deflectors to their proper position. The deflectors may, however, be so adapted to the form of the ear as to keep their places without the 25 aid of the bow, but the bow is preferable as a means of keeping them steady. They can also be attached to a hat or cap or bonnet; or the rim of the hat or cap may be made of suitable form and material to answer the purpose of the deflectors; or plates of metal or other material may be worked into or concealed in the sides of a bonnet, and so adjusted as to act like the deflectors herein-before 30 described, care being only necessary to give them their proper position. These deflectors may be made of any firm material, and for the sake of lightness and strength the material known as "hard rubber" is very serviceable. They can also be made of metal, glass, horn, shell, papier maché, wood, or of any material suitably firm, and can be ornamented to suit the taste. 35

Having now described and particularly ascertained the nature of the said Invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion that what I consider to be novel and

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original, and therefore claim as the Invention secured to me by the herein-before in part recited Letters Patent is,—

First, the general construction and arrangement of apparatus for assisting the sense of hearing, as herein-before described.

5 Second, the combination of the apparatus for assisting the sense of hearing, with coverings for the head, as herein-before described.

In witness whereof, I, the said John Henry Johnson, have hereunto set my hand and seal, this Twenty-sixth day of June, One thousand eight hundred and sixty-one.

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J. HENRY JOHNSON. (L.S.)

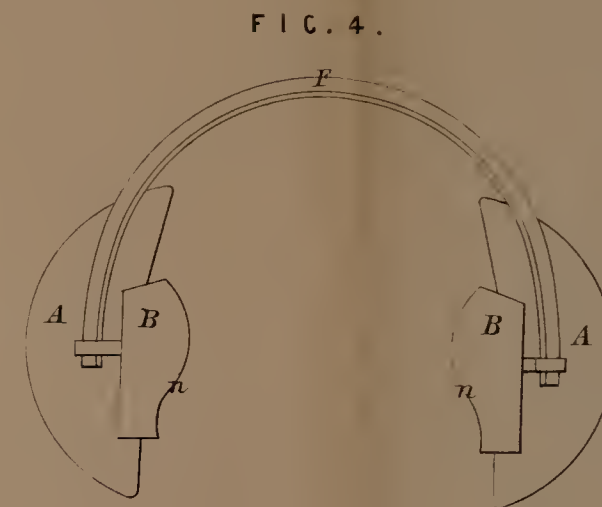
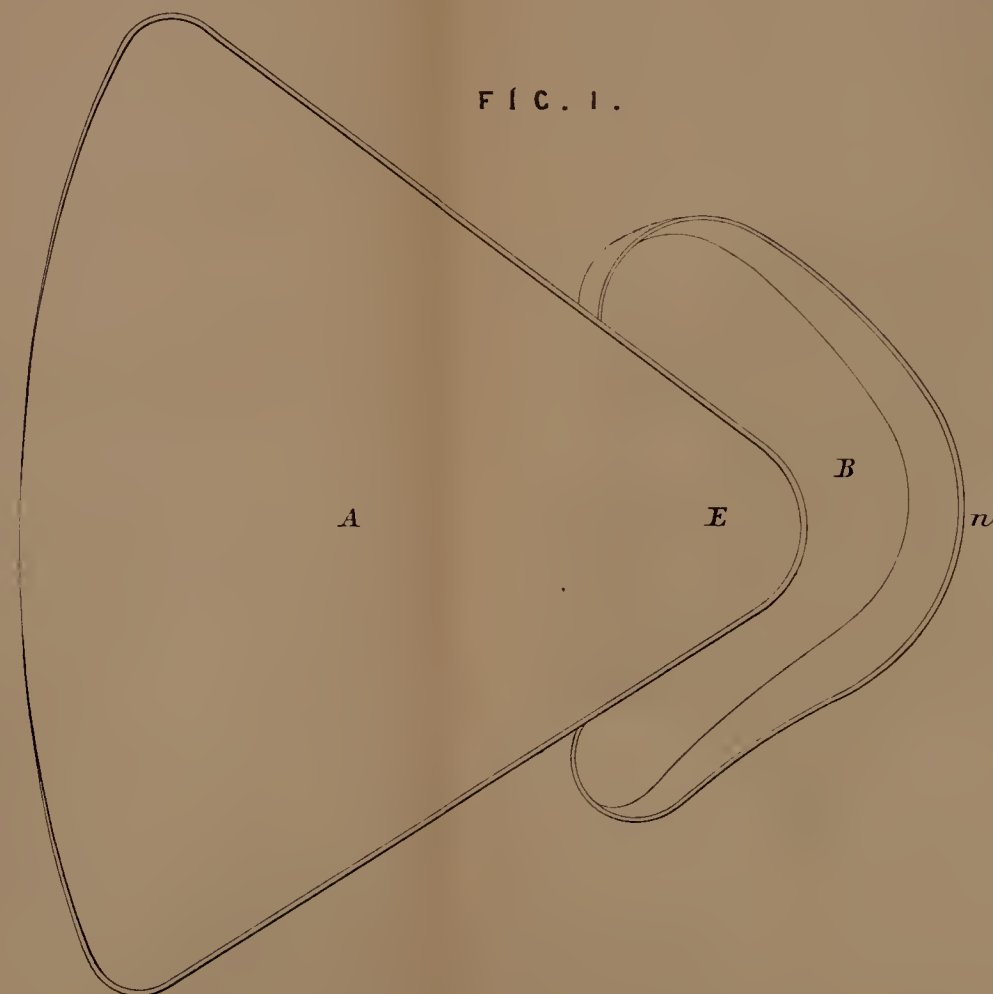
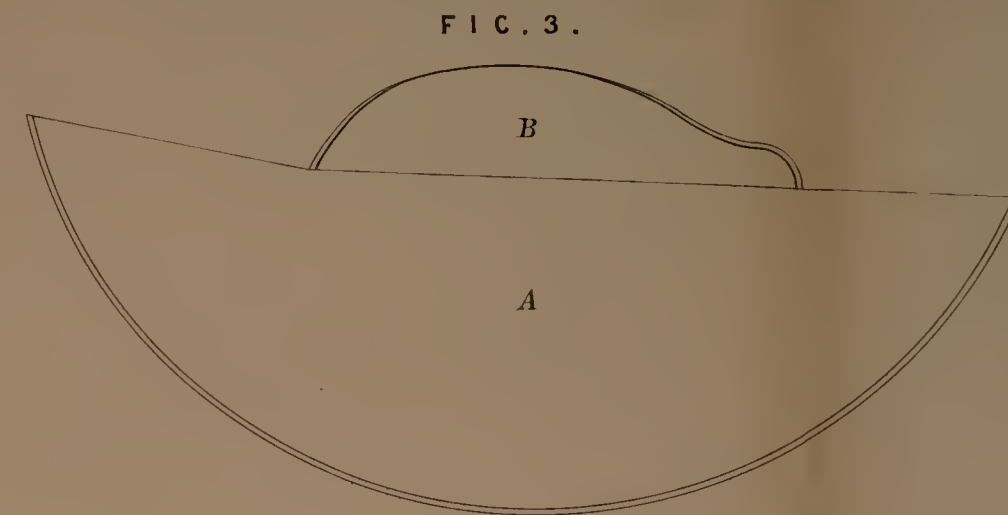
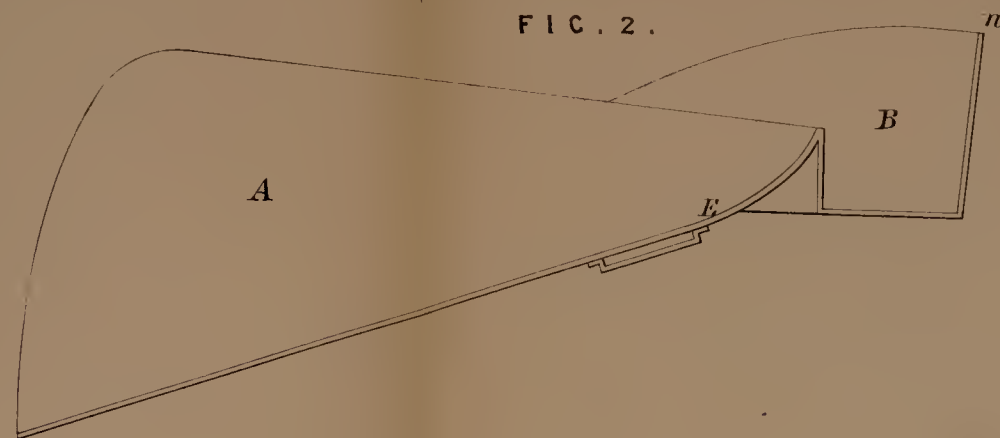
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The filed drawing is partly colored.

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